DOCUMENT RESUME

ED 053 808 PS 004 907

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| AUTHOR | Grotberg, Edith H., Ed.; And Others |
| TITLE | Designs and Proposal for Early Childhood Research: A New Look: Preschool Research and Preschool Educational Objectives; A Critique and a Proposal. (One in a Series of Six Papers). |
| INSTITUTION | Office of Economic Opportunity, Washington, D.C. Office of Planning, Research, and Evaluation. |
| PUB DATE | 71 |
| NOTE | 43p. |
| EDRS PRICE | EDRS Price MF-$0.65 HC-$3.29 |
| DESCRIPTORS | *Child Development, *Educational Objectives, Educational Research, Educational Strategies, Emotional Development, Intellectual Development, Longitudinal Studies, *Preschool Education, *Research Design, Research Needs, Social Development, *Standards |
| IDENTIFIERS | Piaget, Project Head Start |

ABSTRACT

Longitudinal studies to clarify and validate objectives and standards of preschool education are advocated. Until the result of such research is available, studies of methods and processes have little practical or theoretical use. Preschool goals generally agreed upon by American educators are the promotion of the child's emotional and social development, and the improvement of mental processes and skills. Current strategies for further defining these goals include: (1) "bag of virtues" approach, which advocates that the child acquire self confidence, spontaneity, curiosity, self-discipline, and specific aptitudes and skills; (2) the class comparison strategy, which assumes a middle class superiority in attitudes, goals, and general life style; (3) the industrial psychology strategy, which says that in order to make it in the system, children must meet certain standards of language and skills, even though they are not termed "deprived" in terms of their own culture. In contrast, the cognitive-developmental approach, which is exemplified by Piagetian stage theory, is favored and is used in this paper to arrive at a strategy for the definition of education objectives. The child and his development, the use of longitudinal data, and some recent research demonstrating relationships between Piagetian stages of cognition and ego stages are also discussed. (NH)

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# DESIGNS AND PROPOSAL FOR EARLY CHILDHOOD RESEARCH: A NEW LOOK: PRESCHOOL RESEARCH AND PRESCHOOL EDUCATIONAL OBJECTIVES; A CRITIQUE AND A PROPOSAL

Lawrence Kohlberg and Rochelle S. Mayer

Edith H. Grotberg, Ph.D., Editor

One in a Series of Six Papers

OFFICE OF ECONOMIC OPPORTUNITY
OFFICE OF PLANNING,
RESEARCH AND EVALUATION, PRE/R

1971

PS 004907

# Preschool Research and Preschool Educational Objectives; A Critique and a Proposal

Lawrence Kohlberg and Rochelle S. Mayer
Harvard University

In this paper we shall analyze prevalent current strategies for defining the aims and standards of preschool education, and recommend an alternate approach indicating the research necessary to render it concrete. It is safe to say that of the vast amount of research on preschool education, very little has been done either to clarify or to validate its aims, whether compensatory or non-compensatory. Instead of considering how preschool experience may have long-term value, most related research presupposes some conception of such intent while focusing instead upon comparative study of means, methods, or programs of preschool education.

The evaluation of outcomes, at least in terms of follow-up studies conducted, usually consists of scores on standardized intelligence and achievement tests. Yet, while there are a myriad of studies on preschool I.Q. changes, few examine the worth or significance of these changes to later development. We have, for example, a great deal of information on subpopulation characteristics on I.Q. tests, on effects of various programs on I.Q. changes, and on the follow-up or long-range stability of I.Q. changes induced by preschool programs. What we lack are well designed studies and conclusions about the meaning of preschool-induced I.Q. changes as indices of preschool-induced contributions to the quality of adult life. The usual preschool follow-up study tells us that preschool I.Q. gains are not maintained without continuing intervention. However, to discover if I.Q. change--whether permanent or temporary--is an indicator of a worthwhile preschool objective, we must find whether or not I.Q. gains in preschool predict important valued behavior in later life, behavior that may well be socioemotional and not intellectual at all.

In this paper we want to advocate the design of studies clarifying and validating objectives and standards of preschool education. Such studies obviously have to be longitudinal, since we need to assess the long-range effects of a preschool

behavior change before we can really claim that the change represents a valid preschool educational objective. Later we shall suggest some guidelines, based on a theoretical rationale, for such longitudinal work. First, however, we want to state our claim emphatically: until such research is available--and that will require many years--there is little practical or even theoretical use to studies of methods and processes. We have a vast faith in American ability to quickly invent and validate educational methods once sensible aims are clarified, and a considerable pessimism about American ability to formulate sensible aims of education. Indeed, a careful examination of the prevalent strategies for defining preschool aims and standards reveals that they either lack a logical theoretical rationale or are based on empirically unjustifiable theoretical assumptions. For one thing, the strategies for formulating goals and standards are subject to logical criticism. In addition, the objectives themselves usually fail to relate definitely to changes influenced by preschool educational experience; do not predict to favorable long-range consequences in later development even if achieved; or are posited in the absence of the longitudinal research necessary to validate them.

These points will become clearer as we examine, in turn, each of the current strategies for defining preschool education aims.

American educators tend to agree on preschool goals. An example of such agreement is found in the Head Start objectives, as formulated by a panel of authorities on child development. Two of the objectives state:

(1) Helping the emotional and social development of the child by encouraging self confidence, spontaneity, curiosity and self discipline.

(2) Improving the child's mental processes and skills with particular attention to conceptual and verbal skills (from Grotberg, 1969).

To operationalize the first aim of "helping the emotional and social development of the child" into specific observable preschool behaviors would require that the general lines of the child's ego development be empirically charted, and that the preschool behavior changes which facilitate it be discovered.

However, the authorities already seem to know what it means to stimulate general long-range ego development: it means increasing a set of traits or virtues called self confidence, spontaneity, curiosity, and self discipline. Now all these words sound nice, but one might wonder whether promoting self discipline and promoting spontaneity are consistent with one another, or whether either has any favorable consequences for later development. The nicest thing about these trait lists is that a panel of authorities can always come to agreement by adding another nice sounding item to the list -- add self discipline, say, if it cancels out or qualifies other items with which one disagrees, like spontaneity.

The strategy for defining objectives embodied in the Head Start list represents the "bag of virtues approach" to educational aims (Kohlberg and Turiel 1971a). The prototype for this is the Hartshorne and May (1928-30) work on moral character. Hartshorne and May polled psychiatrists, ministers and others as to desirable moral character, and ended with a list of virtues including honesty, service, and self-control. They could instead have used the Boy Scout list--the scout is clean, courteous, brave, reverent, obedient; or they could have taken Aristotle's list of virtues--the good man is brave, temperate, liberal, and just. Hartshorne and May were not bothered by the arbitrariness of the list. What did bother them was the discovery that they could locate no such stable personality traits in school children. A child who cheated on one occasion might or might not cheat on another: cheating was primarily situationally determined. Put in psychometric terms, factor analysis of morally relevant behavior did not yield a clearly identifiable factor or correlation pattern definable as honesty.

What available evidence we have also suggests the nonexistence of the Head Start social bag of virtues traits. Ratings or tests do not yield discriminable and situationally general traits or factors which may be labelled "self-confidence," "spontaneity," etc. The relatively general and longitudinally stable personality traits which have been identified at the preschool level are traits of temperament--introversion-extroversion, passivity-activity, etc.--which do not lend themselves to use as virtues defining preschool objectives (see research reviewed in Kohlberg 1969; Ausubel and Sullivan 1970; Kohlberg, LaCrosse and Ricks 1970).

We have criticized definition of preschool objectives in terms of arbitrary trait lists. More basically, however, we must ask whether a general focus on mental health at the preschool age level can be substantiated on the basis of existing longitudinal research. In other words, do preschool traits with apparent negative mental health implications like dependency, aggression or anxiety, have predictive value as indicators of adult difficulties in "life adjustment" or "mental health"? The answer at present is "No": the mental health traits highlighted in the Head Start objectives, as well as those commonly delineated in other preschool programs, have failed to show--on the basis of existing longitudinal research--their predictive value for positive or negative adult "life adjustment" (Kohlberg, LaCrosse and Ricks 1970.)[1]. Thus, even if the kinds of behavior changes sought in such programs were achieved, the child would be no more likely to become a well adjusted adult than before.

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1. Our review of adult mental health outcomes indicates that the only early childhood variables predicting adult adjustment or mental health are I.Q. and family background. Preschool dependency, withdrawal, aggression, anxiety, etc. do not significantly predict adult mal-adjustment as judged by life status (institutionalization, work adjustment) or by psychological ratings of mental health or adjustment. At the moment there is no evidence that a psychiatrist or psychologist can pick out preschool or elementary children who will have adult mental health or adjustment problems (aside from the few severely retarded, brain damaged or autistic children). Most studies show that three-quarters of the children diagnosed as needing treatment and receiving it get better, but so do three-quarters of the control children diagnosed as needing treatment but not receiving it. These findings suggest that in most cases children referred for treatment as emotionally disturbed are really only undergoing developmental or situational crisis, and developmental lags in learning and social development, which are more or less temporary. Children are considered to be "emotionally disturbed" because they display stable traits considered negative. It often turns out, however, that these traits have no long-range negative adjustment implications. As an example "introversion" or "withdrawal", as commonly defined and rated by teachers and clinicians, has been shown to be in large part a hereditary temperamental trait without negative adaptive significance.

To summarize, many statements of preschool objectives are presented in the form of a list of desirable personality traits, a bag of social virtues. The desirability or "virtuousness" of a trait is based upon its presumed mental health or adjustment significance for later life. In most cases these lists of traits do not predict or correspond to stable general personality dispositions. Where they do lead to such dispositions, they still do not have the long-range adaptive or "mental health" significance implied by listing them in a preschool "bag of virtues."

However, while we have used factor-analytic longitudinal findings to criticize the attention accorded mental health traits in early education, there is a simple and sound core to the mental health approach. The mental health movement in early education has used psychiatric theory and jargon to justify an underlying humane and sensible purpose--that children should have a decent time in school. Whether or not having a good time in preschool predicts adult functioning and adjustment, it is an ethical imperative that school be reasonably pleasant for the child, that it does not make him more miserable than he would be out of school. However, a statement of this goal should be stripped of its mental health bag of virtues claims. The fact that none of the hundreds of preschool evaluations and researches have asked how many children spend how much time crying and how many have a good time is something of a wonder. The one thing about preschoolers that can be rather well determined is whether or not they are having a good time.

Returning now to the second intellectual Head Start objective, we find this also stated in terms of a bag of "virtues" (aptitudes or skills). While much factor-analytic and longitudinal work has been done on these skills, there is as yet no evidence of discrete factors of conceptual or verbal skills distinct from general intelligence with long-range predictive implications. In other words, clear, distinct and stable intellectual abilities have not yet beer established at the preschool level. Rather, intellectual abilities appear to become differentiated with age,

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partly as a result of definite school learning (Garrett, 1966).[2]

Furthermore, the very limited available evidence for the long-range predictive value of tests of discrete mental abilities at young ages is negative. Early tests of general intelligence seem to predict as well to later measures of separate intellectual abilities as do early tests of the given separate abilities involved (Jones 1954). In other words, the bag of intellectual virtues does not fare much better than the bag of mental health virtues in defining justifiable preschool objectives.

In criticizing the listing of intellectual skills as preschool objectives, we mean, however, only to criticize the "bag of virtues" strategy of listing discrete abilities or traits which sound positive, not to criticize a concern with the general area of cognitive development or intelligence as such. Unlike general appraisals of preschool mental health, general appraisals of preschool intelligence or cognitive development do have predictive implications for later life outcomes. The difference between the validity of the intellectual and the mental health areas of concern is not due to the greater significance of the intellectual over the social-emotional as preschool objectives; it is due to the fact that intellectual skills are clearly related to general cognitive development, while mental health virtues, as usually defined, are not clearly related to general social development. The standard of mental health is one thing,

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2. The findings on preschool primary mental abilities are somewhat artificial in that distinct massings of grossly similar tests in a battery and oblique rotation of the resulting factors are necessary to arrive at distinct ability factors (Meyers, et al., 1962). The first unrotated (or "general intelligence" factor) accounts for the majority of the covariation among batteries of ability tests at preschool levels, even though the battery had been selected to maximize discrete group ability factors. To the extent to which discrete ability factors could be said to be isolated, these represented relatively non-cognitive visual-motor skills.

that of social development another. We return at the end of this paper to the question of the appropriate strategy for developing aims and standards in both the cognitive and social area -- a strategy quite different than the bag of virtues strategy just described.

We have talked as if Head Start objectives were defined simply by a committee's view of what are presumably nice traits or skills for children to have. As we know, however, there is a research basis used in defining compensatory education objectives -- that of known differences between disadvantaged and advantaged children. So, there is a second strategy for defining preschool objectives, that of selecting from the bag of virtues those which indicate large differences between the advantaged and the disadvantaged. Based on these differences, preschool experiences are aimed at bringing disadvantaged children "up to par" with their middle class age mates.

The question raised by this approach is that of using middle class characteristics as the normative standard of the good, or educationally significant, and viewing deviations from this norm as "deficits" which need to be eliminated. The use of middle class preschool-age population characteristics as a standard of the "good" is usually justified by the observation that middle class preschoolers tend to become successful elementary, high school, and college students, who in turn, tend to become self-supporting "successful" citizens. Since the same prognosis does not hold for preschool-age children coming from lower class backgrounds, it seems reasonable to suppose that causal factors preventing a like prognosis reside in those traits where large mean differences exist between lower class and middle class preschoolers. The first objection to this rationale, however, is that it assumes a value bias based on an arbitrary class "bag of virtues." In fact, class comparison research yields only class differences, and these cannot automatically be considered "deficits." Many differences may be purely culture-relative, without adaptive significance for development, adjustment, or success.

A good illustrative example of the unjustifiable logic of class comparisons--although it is used in this instance to argue against the viability of compensatory preschool education altogether--is found in Banfield's Unheavenly City (1970). In

Banfield's benign-neglect, moderate-conservative view, it is a fallacy to suppose that compensatory education will materially benefit the disadvantaged because--and he cites class-comparison studies--their deeply rooted lower class culture renders them irreversibly "present oriented" (or more lazy, impulsive, selfish and irresponsible than the middle class). According to Banfield, this orientation is absorbed in early childhood and sustained by membership in the lower class culture, making even the very young disadvantaged child impervious to educational improvement. Anything short of removing the child from his lower class parents at birth--a policy anathema to a free society--and rearing him in "normal" culture, will fail to improve significantly his life chances.

While Banfield holds that middle class future-orientedness is a virtue, militants and radicals will argue that it is a joyless and retentive Puritan-ethic vice. Just because the middle class holds the power and wealth does not mean they hold it because of superior virtue in terms of class differences in children's personality. Because the dialect of lower class blacks is not standard English does not prove that dialect is an inferior linguistic form to the standard English of the middle class. (Baratz and Baratz, 1970).

We have spoken as if the class comparison strategy is invalid because it is subject to the charge of value-bias. In fact, however, the usual flow in the use of the class-comparison strategy is the failure to empirically test the underlying assumptions. Banfield's argument, and the reasoning behind the class-comparison strategy as a whole, assumes that identification of class differences--valid or otherwise-- is tantamount to identification of the underlying cause of the problems of the disadvantaged. But such identification can be made only on the basis of longitudinal evidence; a class-comparison research strategy can not itself demonstrate those differences with causal relation to adult social and economic failure. Needless to say, longitudinal or even cross-sectional evidence to show that present orientedness is a fixed lower class trait causally

predicting much later economic and social failure is absent from Banfield's argument. And the same can be said about the class-difference characteristics most often accentuated in compensatory preschool programs.

When we move from postulating class differences as deficits or virtues to the use of supporting longitudinal evidence, we move into a third strategy of defining preschool objectives--the industrial psychology rationale. We have already said that because a lower class black speaks dialect and the middle class white does not is, in itself, no reason for teaching standard English to blacks. The existence of this difference does not automatically validate it as a "deficit" which requires correction. However, by an industrial psychology rationale we might still find a reason for teaching standard English. Suppose that longitudinal prediction shows that the black who speaks dialect meets with later job failure. This may be because employers are illogical and prejudiced; but still, dialect predicts failure. Thus, while non-standard dialect may be "different," not "defective," it may still be considered a disadvantage; it may be a characteristic of a person which predicts adult social and economic disability in the mainstream of culture.

The industrial psychologist attempts to isolate the characteristics of persons which will predict to their later success in the company or the system. For instance, if a high school boy shows salesmanship interests in high school on the Kuder preference test, will he become a successful Fuller brush man? The criteria of success is based on the company's point of view. Success is promotion and good tests select job applicants who will be promoted with minimal waste. Industrial psychology, however, also assumes that what is good for the company is good for the individual: if he wants to make it in the system, he is better off having good scores on the selection devices.

Analogous industrial psychology measures have been developed for education in the form of achievement tests. These measures succeed in selecting out elementary school children performing well by the already existing criteria or standards of the school,

and they have longitudinal prediction value as well (e.g. high school reading achievement can be predicted by second grade reading achievement).

The observation that elementary school achievement predicts high school achievement has led to the position that preschool education should be aimed at teaching skills and concepts contained in elementary school achievement tests, and these tests should then be used to assess the effectiveness of the preschool experience. Proponents of this view hold that a basic cause of being disadvantaged or poor is having a poor education, operationalized as (a) doing poorly on standard educational achievement tests, and (b) dropping out of education somewhere before the Ph.D. They suggest that the solution to later social and economic failure is success in school. Therefore compensatory preschool education should be aimed at helping disadvantaged children acquire the various skills requisite to school achievement during their preschool years.

Now when the industrial psychology approach is combined with the comparison of the disadvantaged and the advantaged, you have the dominant hard-boiled approach to compensatory preschool aims, perhaps best exemplified in the writings of Bereiter and Engelmann (1966). They say:

> In order to use the term cultural deprivation, it is necessary to assume some point of reference...The standards of the American public schools represent one such point of reference...There are standards of knowledge and ability which are consistently held to be valuable in the schools, and any child in the schools who falls short of these standards by reason of his particular cultural background may be said to be culturally deprived (p. 24).

As Bereiter and Engelmann make clear, like the industrial psychologists, they move from a statement that all educational and social values are relative and arbitrary ("it is necessary to assume some point of reference"), to the notion that one accepts the values of the company, or the system, or the group with authority ("the standards of the American public school represent one such standard"). The industrial psychologist

not only accepts the arbitrary standards of the system, but he substitutes the longitudinal criteria of prediction of promotion for the longitudinal criteria of causation of later performance. Speaking dialect may not predict later success because of its influence on social screening procedures, but it need not be a causal antecedent of some deficit in vocational or social ability or performance. Likewise, we may find that knowing the alphabet at age four predicts, or correlates with, success in beginning reading without thereby justifying the conclusion that teaching a four year old the alphabet will make him a good reader.

From the point of view of the industrial psychology strategy, and the achievement tests based on it, the situation between causation and prediction is unimportant. We can efficiently select those who will do well in college, or will become successful salesmen, or will become juvenile delinquents without facing the causation issue. If, however, we shift from using a test or a behavior as a selector to using it as the criterion for an educational objective, the problem is quite different. Unless a predictor of later achievement, adjustment, or development is also a causal determinant for them, it cannot be used to define educational objectives or to constitute a statement of effective education.

Within these intrinsic limits of the industrial psychology strategy for defining preschool objectives, some rationale for their definition is provided. Unfortunately there is as yet no definition of preschool objectives which meets even the adult preformance criteria demanded by such an approach. For example, while Bereiter and Engelmann state that disadvantaged preschool children should be taught the "knowledge and ability... consistently held to be valuable in the schools," they abandon good industrial psychology prediction criteria in favor of class comparison criteria when delineating those skills and abilities. Since language differences are the most obvious preschool social class differences, these are assumed to predict academic success. Perhaps middle class children do talk better, and perhaps they have better manners; but even to the industrial psychology rationale such differences are not necessarily basic to academic success. Bereiter and Engelmann, of course, do not use manners or grammar but achievement tests as the basic

recognized "standards" of knowledge transmitted by the school. And we all know that grades and achievement scores in elementary school predict the same for high school which predict the same for college. However, at the moment longitudinal studies indicate that school achievement predicts nothing of value other than itself. School achievement seems to relate to later success because it is associated with intelligence and social class without independently contributing to life adjustment.

In terms of future job success, high school dropouts do as well as graduates who do not attend college; high school graduates with poor achievement scores and grades do as well as those with good scores; and college graduates with poor grades do as well as those with good grades. Similarly, for lower class blacks and whites, poor school achievement does not predict to psychosis, criminality or alcoholism, when early anti-social behavior is controlled. There is no direct evidence that poor schooling, as measured by years and achievement scores, will increase life adjustment or success. [3]

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3. The most obvious expected outcome of school achievement is job success. With I.Q. controlled, however, the only way in which school achievement furthers job success is through facilitating entrance into college. One source for this generalization comes from a large-scale study by Combs and Cooley (1968) of the later (early twenties) job success of two groups; high school dropouts and high school graduates who did not go on to college. Both groups were equivalent in class background and in I.Q. The male dropouts were doing slightly better, not worse in terms of income and job-status, than the high school graduates (mainly due to their longer job experience).

Little (1967) studying the relation of later occupational success to high school achievement found that although differences in level of education (college - non-college) produced important differences in attained level of occupations, differences in high school performance had very little effect on the level of occupations attained in any of the groups. The median percentile rank in high school achievement of male graduates who were in occupations that had prestige scores

We have questioned academic readiness or achievement as preschool goals on the grounds that they are not even good predictors of the crude industrial psychology indices of adult success and adjustment. Advocates of academic readiness have confused success in school with success in life. The studies mentioned question the value of an early education program whose prized effect is to raise elementary school

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below 70 was the same as the rank of all male high school graduates.

Students who were high-achieving in high school who did not go to college failed to obtain occupations that were substantially better than the occupations of their lower ranking classmates. Even more remarkable is the fact that low-achieving students who attended college attained occupations equivalent to their much higher-ranking college classmates. The correlation coefficient between rank in high school graduating class and prestige score on a trained occupation was found to be .08.

In summary then, graduating from college (and graduate school) predicts to occupational success, but graduation from high school does not. While high school academic achievement aids college entrance because of current college screening procedures, there is no convincing evidence that high school or college grades or achievement are themselves predictors of occupational achievement if intelligence is controlled.

Turning to general adult adjustment, one of the studies best controlling other factors is that of Robins (1966). This study followed up the adult adjustment of mainly lower class white children who were referred to a child guidance clinic. School achievement did not differentiate children later becoming psychotic or neurotic from those who were well as adults. While low achievement did predict to later alcoholism and criminal or sociopathic behavior, this was due to the fact that children engaging in anti-social behavior also did poorly in school. When anti-social behavior (including school truancy) was controlled, there was no remaining predictive power of school grades to predict to sociopathic or alcoholic adult disorders.

achievement--when that achievement has no demonstrable value for the child's later life. The studies also suggest that the problem with the academic preschool approach is that it has confused general intelligence with arbitrary achievement. What the longitudinal studies show is that the longitudinal stability or predictive power of school achievement tests is largely due to a factor of general intelligence. In other words, there is no general achievement factor with I.Q. controlled. Thus achievement tests correlate with I.Q. and both measures predict later school achievement. However, we cannot then assume that if you boost the child's school achievement, you'll boost his general intelligence because the causal factor lies in I.Q., not school achievement. While early elementary I.Q. predicts later achievement, early elementary achievement does not predict later I.Q. nor does it predict later achievement any better than early I.Q.

Bright kids learn what they're taught in school faster but learning what they're taught in school doesn't make them brighter. The Bereiter and Engelmann child taught that a cup is a container is no smarter than he was before. If left alone for a few years, he would learn that anyway; and having learned it, he is not better able to think than before.[4]

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4. Here is an observation made at a Bereiter-Englemann school:

> In my visit to the school, the teacher told me how much the preschool children had learned over the year. When they came in, they knew no numbers; now they could add three numbers on the board. After I watched a five year old boy add and subtract on the board I took some raisins out and put four in a spread out line and five in a line squeezed together (so that the four raisins made a longer line). I said 'take the line of raisins that has more raisins in it. You can keep them.' The boy sweeped up the line of four raisins and ate them. I repeated the procedure saying first 'Now count them for me.' The boy counted correctly, but again chose the line of four raisins. Not only did the boy not conserve number in Piaget's language, but he did not equate the counting, addition, and subtraction he had learned to judging more or less in the real world. He still thought about number like a four year old, his thinking was not developed by the school, even though his number skills or achievement was advanced.

We have criticized a focus upon academic achievement in defining preschool objectives as: (1) being based on an industrial psychology rationale with intrinsic flaws, and (2) not meeting even those criteria successfully. These criticisms do not imply that schools should be unconcerned with academic learning. They do suggest: (1) a heavy element of arbitrariness in current school objectives in academic learning; (2) the inability of educational and testing psychology of the industrial psychology variety to make these objectives less arbitrary; and, (3) the illegitimacy of assuming that if academic achievement is good, introduction of the achievement earlier is better.

Achievement tests are made to select children performing well according to the already existing criteria or objectives of the schools. They do not lead to a better set of objectives. To use achievement tests to define educational aims is like using scores on the Kuder preference test for salesmanship as aims of vocational high school training. Moreover, achievement tests are based on the industrial psychology assumption of marking on a curve. This generates the self-contradiction highlighted by Ed Zigler in a number of public comments: that the goal of compensatory education is to have everyone in the country score above the 50th percentile on achievement tests. The confusion behind using achievement tests or grades as criteria of compensatory education resides in the failure to correctly interpret the predictive power of achievement tests (that preschoolers' cognitive ability and development is correlated with achievement scores does not mean that intervention to increase achievement scores will increase cognitive ability or development) and in the confusion between evaluating the success of an individual within an arbitrary system with the success or worth of the system itself. If psychology and testing are to help education, it will not be by creating tests designed to predict relative success within the arbitrary framework of the historically determined demands of a particular school system.

We have talked about the academic preschool as being based on the industrial psychology rationale. More fundamentally, it is based on a cultural learning or training

conception of education, which Dewey (1938) termed "the conception that the chief business of the schools is to transmit bodies of information and skills worked out in the past to the new generation." Like the "industrial psychology" rationale, the "cultural training" approach tends to take the social system's point of view, to define educational ends for the individual in terms of degree of internalization of, or match to, the cultural system.

The psychological foundation for the cultural training approach is the associationistic-environmentalist tradition--variously called "learning theory," "behaviorism," "socialization theory," and "internalization theory" -- that ranges historically from John Locke to Thorndike, Hall, Watson and Skinner. In the field of education Dewey called this approach "traditional," although the contemporary equivalent--considered new and innovative-- is called "educational technology" and "behavior modification." The tradition assumes that knowledge and values--first located in the culture--are afterwards internalized by children copying adult behavior models, or through the mechanisms of didactic instruction and reward and punishment. Whereas industrial psychology identifies educational success with the individual's ability to respond favorably to the demands of the system, cultural training psychology identifies success with the transmission of cognitive and value content prized by the system.

In contrast, the mental health strategy for defining educational objectives, tends to be linked to a maturational, as opposed to a cultural training, psychological theory. Continuing from Rousseau to followers of Freud and Gesell, this maturationist stream of thought holds that what is most important in the development of the child is that which comes from within him, and that the pedagogical environment should create a permissive climate to allow inner "goods" (abilities and social virtues) to unfold, and the inner "bad" to come under control of the inner good without being fixated by adult cultural pressures. It stresses the biological metaphor or concept of health in defining the goals of education in relation to development. Just as optimal physical development tends to be equated with bodily health, the maturationist position

equates optimal mental development with mental health. Accordingly, preschool should promote a well-rounded healthy psyche by promoting aspects of emotional development not allowed expression in the home, such as the formation of stable social relations with peers, and non-parental adults.

In addition to the cultural training and maturational theories of child psychology and education, there is a third stream of thought, the "cognitive-developmental" or "interactional." This line of theory, first clearly formulated by John Dewey (1930) and J. M. Baldwin (1906-15) in America, has been elaborated by Piaget (1947), Werner (1948), and Vygotsky (1962) in Europe, and by their followers in America (Kohlberg, 1969). Like maturational theory it stresses culturally universal trends and stages of development. However, it assumes that such development is the product not of the unfolding of innate qualities, but of interactions between the organism and the environment. Further it emphasizes that the core of development is not the unfolding of instincts, emotions, or sensorimotor patterns, but is cognitive change--change in distinctively human, general patterns of thinking about the self and the world.

The maturational approach assumes that development is the unfolding of an innate pattern; thus, an unconflicted environment which is capable of fostering healthy development becomes an educational aim. In contrast, for the cognitive-developmental approach attainment of a higher level or stage of development in adulthood is the educational goal--it identifies the aim of education with development itself, not with health. According to Dewey, true education is the stimulation of the development of the child; and the organizing and developing force in the child's experience is the child's active thinking. Educative experience is experience that makes the child think--think in ways which organize active doing, both cognitive and emotional. Unlike the cultural transmission view, Dewey sees the acquisition of "knowledge" as an active change in patterns of thinking engendered by experiential problem-solving situations.

Specifically the cognitive-developmental theory, which we will use to arrive at a strategy for the definition of

educational objectives, assumes the following:

(1.) The terms "cognition," "thought," or "intelligence" refer to adaptive actions upon objects or internalizations of such actions. Mature or adequate cognition is defined by an equilibrium or reciprocity between action and object, rather than by conformity to cultural standards of knowledge. The encouragement of cognitive development, then, is the provision of opportunities for activities of an organized or equilibrated form.

(2.) Cognition proceeds through stages of structural reorganization. While cognitive functions are present from birth, cognitive structures are radically different from one stage to the next.

(3.) The implication of structural reorganization in development is that the source of cognitive structure and of cognitive development is to be found neither in the structure and maturation of the organism nor in the teaching structures of the environment but in the structure of the interaction between organism and environment.

(4.) The optimal conditions for such structural organization entail some optimal balance of discrepancy and match between the behavior structures of the child and the structure of his psychological environment.

(5.) There are from birth inherent motives for cognitive activities; these motives do not need to be taught, although they too undergo structural change in development.

(6.) Cognitive and affective development are parallel aspects of the structural transformations undergone in development.

While all of the above ideas are common to all writers in the cognitive-developmental tradition, Piaget's work has been the first to apply these assumptions to children's behavior in logically precise and empirically specified form. Piaget's work has empirically demonstrated that the evolution of logical thought takes place in irreversible invariant stages. Cognitive stages, as studied by Piaget, have the

following characteristics (Piaget, 1960):

(1.) Stages imply distinct or qualitative differences in children's modes of thinking or of solving the same problem at different ages.

(2.) These different modes of thought form an invariant sequence, order, or succession in individual development. Cultural factors may speed, slow, or stop development, but not change or reverse its sequence.

(3.) Each of these different and sequential modes of thought forms a "structured whole." A given stage-response on a task does not just represent a specific response determined by knowledge and familiarity with that task or tasks similar to it; rather it represents an underlying thought-organization.

(4.) Cognitive stages are hierarchical integrations. Stages form an order of increasingly differentiated and integrated structures to fulfill a common function. Higher stages displace, or rather reintegrate, the structures found at lower stages.

While Piaget's own work has focused primarily on uncovering cognitive stages, (especially stages of logico-mathematical operations) stages meeting the criteria of structural reorganization are also found in the area of social and moral values and emotions (Kohlberg, 1969). These various areas (cognitive, moral, psychosexual, motivational, etc.) are related to each other by a fundamental unity of personality organization termed the ego or self. In other words, these various functions are united by their common reference to a single concept of self in a single social world (Kohlberg 1969; Loevinger 1970). This overall unity termed ego-development may serve to define the ultimate aims of education as development. In examining the educational implications of the psychological theory of development as elaborated by Piaget, we need to place it in a general developmental philosophy of education, presented in its most comprehensive form by Dewey (1913; 1930; 1938; 1965).

The remainder of this paper will elaborate the exact significance of this developmental approach for a research-based strategy defining definite preschool educational objectives. First, however, it will be helpful to summarize our criticism of the other strategies so far discussed. We have challenged the prevalent strategies for defining objectives by presenting findings which demonstrate the tremendous importance of longitudinal study for the formulation and validation of preschool aims. The bag of virtues and class comparison strategies have been found wanting because they ignore longitudinal development. The industrial psychology strategy offers a longitudinal approach for the formulation of aims by focusing on empirical preschool prediction of later success. It fails, however, to provide a basis for defining an educationally valuable predictor by not distinguishing behaviors causally necessary for later development or success from those which are merely arbitrary predictors of it. And furthermore, it provides no ethical or rational base for imputing inherent values to these predictors.

The cognitive-developmental approach uses longitudinal data in a different way. First, it uses the data to isolate culturally universal natural stages or sequences in development. It argues philosophically that maximal stage development in this sense is a non-arbitrary criterion of "success" for education since natural age-developmental trends are not arbitrary points on a normal curve, but an ordinal series of definite qualitative levels. And each stage is not a mere predictor but a causal antecedent of the next level of structural reorganization in the sequence; ethically, it is educationally valuable as an index of a more organized and adaptive mode of functioning. Each new stage is a change in shape, pattern, or quality of response, not merely in the frequency of its correctness according to an external criterion. Having defined sequences in this way, it goes on to use longitudinal data to determine the long-range effects of intervention at various periods in determining eventual developmental outcome.

Before considering the research strategy itself, we must clarify further the developmental claims about educational

aims with regard to the following questions.

(1.) Can we say some behavior changes are developmental and others not? If so, what criteria have to be met in order to consider a behavior or function developmental? (This question is debated by Bereiter (1970) and Kohlberg (1970a)).

(2.) In what sense does knowing that a type of behavior change is developmental make it more valuable or relevant as a focus for educational objectives?

(3.) In what sense is development not only a value but an ultimate educational criterion or value? What is the relation of facilitating development to promoting long-range favorable consequences for the individual's and society's life? Are ultimate development and immediate promotion and acceleration of development equivalent goals?

(4.) Is the goal of stimulating development feasible? Can educational experiences make a relevant contribution to development?

With regard to the first issue, Webster's (Seventh New Collegiate Dictionary) tells us that to develop "means to make active, to move from the original position to one providing more opportunity for effective use, to cause to grow and differentiate along lines natural of its kind; to go through a process of natural growth, differentiation, or evolution by successive changes." Not just any kind of change over time is development, only change which is sequential or ordered, which is more differentiated, adaptive, etc. To call a behavior change "development" implies that it meets the following criteria:

(1.) The change is irreversible. Once it has occurred the change cannot be undone, forgotten, or replaced under normal conditions.

(2.) The change is general over a field of responses and situations.

(3.) The change is a change in shape, pattern, or quality of response, not merely in the frequency of its correctness according to an external criterion.

(4.) The change is sequential; it occurs in an invariant series of steps.

(5.) The change is hierarchical, i.e., later forms dominate or integrate the earlier forms of response.

When all these criteria are met by a set of behavior changes, these changes are termed stages or structural reorganization. Not all behavior changes of interest to educators meet these criteria. For example, it seems very unlikely that vocabulary learning is an area of structural reorganization. Not only is vocabulary learning reversible (we forget the meaning of "amanuensis") but vocabulary changes are not qualitative. Neither are they general in any structural sense; knowing the meaning of "amanuensis" has no general implications for vocabulary functioning. If one does not generate the word "amanuensis," it indicates nothing more than that. Furthermore there are no clear sequences in vocabulary learning. Frequency of use and difficulty make some words attainable later than others but there is no universal sequence in which a certain word must be mastered before another. Further, there is no hierarchical dominance in the use of these responses.

In contrast, as Piaget's work on cognitive stages demonstrates, there are some behavior changes which do meet the developmental criteria. While the behavior changes called "development" are labelled "natural," this does not mean they are the inevitable result of biological maturation. In general, but not always, structural development is found in areas of response that all children display, and that seem to change with age in all children even in the absence of specific instruction. Because the experiences necessary for structural development are believed to be universal human experiences, it is possible for the child to develop the behavior naturally, without planned instruction. However, the fact that only about half of the adult American population fully reaches Piaget's stage of formal operational reasoning (Langer and Kuhn, 1971) demonstrates that such development is not inevitable.

We must next consider what is added to our understanding of its value to label a behavioral change "development." A great deal of confusion on this issue has resulted from the fact that many behavior changes commonly labeled "growth and development" do not meet the criteria of developmental change. Thus Dewey (1938) writes:

> The objection made [to identifying the educative process with growing as developing] is that growth might take many different directions: a man, for example, who starts out on a career of burglary may grow in that direction ... into a highly expert burglar. Hence it is argued that 'growth' is not enough; we must also specify the direction in which growth takes place, the end toward which it tends. Before ... we decide that the objection is conclusive we must analyze the case a little further.

If, indeed, increased proficiency in burglary can be defined as development, then the development concept does not represent valid criteria for defining positive educational objectives. In fact, we may note that it is customary to use the term "growth and development" in a loose, vaguely honorific way, but then to add terms to specify "the end toward which it tends." Thus the Head Start committee talked of "stimulating social and emotional development," but then specified its end in terms of a bag of virtues--curiosity, spontaneity, self discipline. The developmentalist would argue that when development is properly specified, we need no further bag of virtues or value-judgments to define it as a positive education objective.

The objection, then, that growth may take many different directions, or that to call something growth is not to say it is moving in an educationally desirable direction, does not apply to the development of structures whose course is directional and invariant. In fact, what is most properly called development is not only directional, but a movement towards greater adaptation, differentiation and integration. Each stage is a more differentiated, comprehensive and integrated or equilibrated structure than its predecessor, and the fundamental cause of movement from one stage to the next is

that a later stage is better, more adequate in some universal sense, than an earlier stage. Piaget's psychological theory explaining why children move from concrete to formal operations, for example, is built upon his philosophic or logical theory that formal operations are a more adequate integration of thought patterns than are concrete operations. In similar fashion, our own psychological theory for explaining why children move from one moral stage to the next is built upon a philosophical or ethical theory claiming that each higher stage is more morally, and logically, adequate than the one below (Kohlberg 1970b).

While these developmental, philosophic and psychological theories may be questioned on many issues, for the purposes of this paper it is sufficient to note, that before the developmentalist calls something "development," it must meet a set of empirical and philosophic criteria which represent serious and clear claims to educational worth.

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5. Some critics have challenged the claim that higher stages are more adequate than lower stages on the ground that "cognitive adequacy" or "moral adequacy" are culturally relative or arbitrary judgments. Such challenges ignore the fact that stages are culturally universal, not culturally relative. If relativists admit this fact, they must essentially fall back upon a "know-nothing" or self-contradictory form of relativism. For someone to claim that all truth or cognitive adequacy is relative is to make a meaningless statement, since the claim "truth is relative" must itself be true if it means anything. Accordingly those who believe truth is relative must remain silent about matters of truth. In similar fashion to claim that moral value is relative is to deny the concept that the term moral value has meaning, a position which implies ceasing to make value judgments.

A developmental strategy for defining educational objectives must also cope with the problem of competing forms of development. While "development" may always confer some kind of worth, there are various types of development -- some individual, not universal--each with competing worth. The instance of "growth in burglary" raises the question concerning forms of growth which are not universal but individual. Dewey's (1938) example continues:

> That a man may grow in efficiency as a burglar... cannot be doubted. But from the standpoint of growth as education and education as growth the question is whether growth in this direction promotes or retards growth in general. Does this form of growth create conditions that shut off the person who has grown in this particular direction from the occasions, stimuli, and opportunities for continuing growth in new directions? What is the effect of growth in a special direction upon the attitudes and habits which alone open up avenues for development in other lines?

According to Dewey the worth of any special form of growth must also be judged in terms of its impact on and relevance to general development. A child who displays unique interest in dinosaurs may be moving towards an educationally desirable objective or he may be withdrawing attention and interest from the cognitive and social stimuli for development in the world around him. The solution for any given case is difficult, but the criterion is clear: the value of the interest is determined by its implications for further general development.

This criterion of later general development is meaningful because (as we discuss later) there does appear to be something called "general development" or "ego development". Considerable longitudinal study of general development is necessary, however, before particular sequences of development can be awarded positive or negative values as educational objectives. As an example, all Piaget's age trends and sequences in cognitive development are not necessarily legitimate aims of educational stimulation. Kamii (1970) has attempted

a program of preschool intervention related to the chapter headings of Piaget's books; since Piaget studies the development of space concepts, she would teach or stimulate the development of such concepts. Yet, surely the fact that a kind of conceptual development was of interest to Piaget is no warrant for treating it as a preschool education goal. One may question increasing development in spatial conceptualization almost as much as one may question increased understanding of dinosaurs. The research work necessary to justify either goal, however, has been suggested by Dewey: this work is to see whether a preschool program for stimulating space concepts or dinosaurs leads to later further advance in other aspects of development.

Very little longitudinal research has yet been done of the sort necessary to fully justify an educational goal from the developmental perspective. There is yet no evidence that stimulating Piagetian space concepts will accelerate general development of concrete operations; or that stimulating, or accelerating, the appearance of concrete operations will stimulate the ultimate attainment of Piaget's highest cognitive stage, formal operations. Indeed, to illustrate an example of longitudinal findings approximating these criteria, we will have to draw upon work in moral development, though it has no direct relevance to the preschool field. This work yields the following findings--still somewhat provisional because of sample size (Kohlberg and Turiet 1971b):

(1.) There are culturally universal sequential stages of moral judgment development.

(2.) Age of appearance of earlier stages of development predicts to eventual adult terminal level (moral maturity at age 13-15 predicts maturity at 25-29 : $r = .78$).

(3.) There is an open or sensitive period in such development in the preadolescent period. While moral maturity at age 13-15 predicts to terminal status maturity, at age 9-11 it does not.

(4.) Systematic, theoretically based educational intervention in this period is able to advance "retarded" children almost one stage.

(5.) On one year follow-up, children exposed to educational intervention retain their lead over the control group.

It is clear that longitudinal findings of this sort provide a strong rationale for a moral development educational objective in the relatively specified age-period of preadolescence.

Research programs combining experimental intervention and longitudinal study of this order, difficult as they are, seem required to define ultimately sound preschool objectives. Because findings based on such research are a generation off, it may be worthwhile to extrapolate from current knowledge to locate areas of preschool development likely to meet the necessary full longitudinal criteria, because they already seem to meet the following preliminary criteria:[6]

(1.) Age-developmental change which is qualitative and sequential or is at least unidirectional and cumulative.

(2.) Sequences which are the same for lower and middle class children, but which disadvantaged children advance through at a slower rate.

(3.) Sequences related to general cognitive maturity or intelligence.

(4.) Areas or traits relating at least crudely to adult adjustment apart from intelligence.

(5.) Traits indicating some longitudinal stability: a change in the trait through preschool experience should predict to ultimate adult level on the trait.

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6. A detailed review of these areas is included in a forthcoming book (Kohlberg and Lesser, in preparation).

(6.) Modifiability of the trait through preschool intervention.

When we apply this developmental aims criteria to preschool behavior, we arrive at a paradoxical result: the trait loosely meeting most of these criteria -- general intelligence or general cognitive maturity -- is a trait most used as a goal and standard of preschool education and has yielded most disappointing results. As we noted earlier, some claim may be made for using general intelligence as a basis for defining a preschool educational objective, by either an industrial psychology or developmental rationale; however, this criterion has failed in one major regard. Preschool education programs have proved unable to have major long-range effects in modifying it (Kohlberg 1968). This failure may be explained as due to the biological components of intelligence or to the effects of the psychological environment in the infant period. If the latter is stressed, we have one impulse for the Day Care movement. We predict, however, that if the "raise the I.Q." Head Start movement is transferred downward to the Day Care movement, it will yield equally disappointing results. Psychometric general intelligence is to a large extent fixed by the preschool period because of biological factors of heredity and biological factors of perinatal and infant environment, such as the nutritional factor, rather than by early psychological environments (Kohlberg 1968).

We shall argue, however, that intelligence as a preschool criteria has failed only partly because of the biological component of general intelligence. There is another basic reason--the adoption of a non-developmental conception of intelligence. While the psychometric conception of intelligence is valid for many purposes, it is not valid for guiding preschool cognitive intervention or for measuring its effects because it is not fully developmental.

Psychometric tests of general intelligence are based upon three distinct rationales: (1) the concept of a general level of cognitive development: underlying Binet's notion of mental age, this concept was never fully developed until Piaget

started his research on the qualitative-developmental components of Binet's tests, which ultimately led to measures of stage development; (2) the concept of innate or biological cognitive capacity or potential, initially elaborated by Spearman in his tests of "g"; and, (3) the American rationale of industrial psychology.

The industrial psychology "practical value" criterion of intelligence tests, is primarily its value for selection rather than its ability to specify educational goals. This is reflected in the use of the Binet tests for weeding-out children from the classroom who were "defective", or who "lacked the capacity" to profit from age graded academic learning. Thus the British used 11+ achievement-intelligence exams for selecting out those "capable of profiting" from a liberal secondary education.

This industrial psychology use of the intelligence concept, coincides closely with the biological capacity theory and method of intelligence-testing (Kohlberg and DeVries, 1971). It does predict school achievement and later life success, but it cannot possibly provide a basis for preschool educational objectives because the capacity concept of intelligence implies non-modifiability. Children can be said only to be "not developing or achieving according to capacity"; educational experience can bring children to capacity, but not change it. This is the conclusion one derives from Head Start I.Q. gains, which later "wash out." No other conclusion, however, could well come out of the I.Q. test results, given the initial rationale and construction of I.Q. tests.

The first mistake of the Head Start program was to define cognitive goals in terms of a bag of discrete intellectual virtues (conceptual and language skills) which according to existing evidence has no meaningful existence at the pre-school level apart from general intelligence. Its second mistake was to assume that educational promotion of the bag of virtues would be reflected in changes in psychometric intelligence, which was defined and measured by a strategy for isolating unchangeable capacity.

In contrast to the psychometric concept of intelligence, the developmental level concept of intelligence does provide

a standard or a set of aims for preschool education. It does not assume a concept of a fixed capacity or "intelligence quotient" constant over development. In this sense, developmental level is more like "achievement" than like "capacity," but developmental level tests differ from achievement tests in several ways. While the developmental level concept does not distinguish between achievement and capacity, it distinguishes between cognitive achievement (performance) and cognitive process (or competence). Developmental tests measure level of thought process, not the difficulty or correctness of thought product. They measure cognitive competence, the basic possession of a core concept, not cognitive performance, the speed and agility with which the concept is expressed or used under rigid test conditions.

Psychometric and developmental level theories and measures of intelligence are quite different. In practice, however, the two kinds of measures are highly correlated with one another, explaining why clear, theoretical and operational distinctions between the two concepts of intelligence have not been made until recently. Factor-analytic findings (Kohlberg and DeVries 1971) now provide an empirical basis for this distinction. While psychometric measures of general intelligence, and of "primary mental abilities" at mental age six, correlate with Piagetian measures of cognitive level, there is also a common factor to all developmental level tests factorally independent of general intelligence or of any special psychometric ability. In other words, it is possible to clearly distinguish between capacity and developmental level concepts and measures of intelligence.

Given the distinction between psychometric and developmental level concepts of intelligence, it is clear that the latter are of more help in establishing aims and standards of preschool education. In the first place, the core structure defined by developmental tests is in theory and experiment more amenable to educational intervention--Piagetian theory is a theory of stage movement occurring through experience of structural disequilibrium (Kohlberg 1968). Second, Piagetian performance predicts later development independent of a fixed biological rate or capacity factor,

as demonstrated by evidence of longitudinal stability or prediction independent of I.Q. (Kohn, in preparation). Because Piaget items define invariant sequences, development to one stage facilitates development to the next. Third and most important, Piagetian test content has cognitive values in its own right. If a child is able to think causally instead of magically about phenomena, his ability has a cognitive value apart from arbitrary cultural demands--it is not a mere indicator of brightness like knowing the word "envelope" or "amanuenisis." This is reflected in the fact that Piaget test scores are qualitative; they are not arbitrary points on a curve. The capacity to engage in concrete logical reasoning is a definite attainment, being at mental age six is not. We can ask that all children reason in terms of logical operations; we cannot ask that all children have high I.Q.'s. Fourth, while Piaget sequences are universal across classes and cultures, and have cognitive value apart from cultural demands, they are relevant to the compensatory education rationale. Disadvantaged children score lower than advantaged children on these measures when psychometric intelligence and verbal fluency are controlled (Kohn, in preparation).

Let us now consider what Piagetian intelligence measures might mean as defining aims of preschool education. Two related theoretical issues are critical in considering this problem: "horizontal decalage," and the relation of intelligence to ego-development. With regard to the former, Piaget distinguishes between the appearance of a stage and its "horizontal decalage," its spread or generalization across the range of basic physical and social concepts and objects to which the stage potentially applies. As a simple example, concrete logic or conservation is first noted in the concept of mass and only later in weight and in volume. Accordingly, acceleration of the stage of concrete operations is one educational enterprise and the encouragement of decalage of concrete reasoning to a new concept or phenomenon is another.

We have argued that when tests are used to define a general cognitive maturity factor distinct from "g," or mental age, this factor is primarily a factor of "horizontal

decalage," not of acceleration (Kohlberg and DeVries, 1971). Psychometric brightness heavily influences performance on "pure" tests of conservation or concrete reasoning, but is less determinative of the application of concrete reasoning to areas of causal thinking, concepts of dreams, of social identities, etc. We therefore conclude that the Piagetian intelligence factor represents not the child's capacity for logical thought, but his "possession of a logical mind"--the degree to which he has organized his experience or his world in a logical fashion.

The role of such decalage in future cognitive development urgently requires longitudinal study. It is likely that horizontal decalage, rather than age of first appearance of concrete operations, predicts to later formal operational thought. Formal reasoning develops because concrete reasoning represents a poor though partially successful strategy for solving many problems. The child who has never explored the limits of concrete logical reasoning and lives in a world determined by arbitrary unexplained events and forces, will see the limits of the partial solutions of concrete logic as set by intangible forces, rather than looking for a more adequate logic to deal with unexplained problems.

Our discussion of Piagetian intelligence as "horizontal decalage" suggests that measures of Piagetian decalage are more closely tied to ego development than are psychometric measures of intellectual capacity and fluency as such. This linkage may be stated in two ways. First, the Piagetian approach tests basic "belief" about reality rather than information or ability. In Piaget's earlier terminology, his tests gauge the child's differentiation of subjective appearance and imagination from objective reality. In more recent writings (1969) he calls this attitudinal component the development of "the feeling of necessity" attached to the products of logical reasoning, i.e. the resistance of logic to distortion by perceptual and emotional suggestion. This "orientation to reality" aspect of Piagetian tasks is demonstrated in a study by Linden (in preparation) in which psychotic children of average psychometric intelligence were found to be grossly

immature in certain Piagetian tasks. Again these tasks were less the classical indicators of onset of operational reasoning (conservation), and more tasks involving the sustaining of the appearance-reality distinction in compelling situations, sustaining, for example, causal reasoning in areas of potentially magical explanation.

The second way in which the bearing of Piagetian cognition upon ego development may be stated is in the relation of physical to social concepts. Our Piaget test battery would not be considered cognitive by a teacher who had never read Piaget. Some involve moral judgment--as to whether a child should be punished for accidentally breaking something when his intentions were good. Some involve sex and birth--whether a little girl could be a boy if she changed her hair and clothes. All, however, are tests of what Piaget calls concrete logical operations and of the differentiation of subjective experience from objective reality.

The cognitive development of the child's core beliefs about the physical and social world, then, constitutes a center of what is called ego development. Much recent research demonstrates that the development of the ego, as attitudes and beliefs about the self, involves step-by-step parallel development of attitudes and beliefs about the physical and social world. Further, it indicates definite stages of ego-development, which imply step-by-step parallels to Piaget's cognitive stages, though they include more social emotional content than Piagetian cognitive stages. The clearest logical and empirical demonstrations of the relationships between Piagetian stages of cognition and ego stages are provided for infant development in the work of Decarie (1965); for preschool development in Kohlberg's work (1966, 1969); and for elementary school and adulthood in the work of Van den Daele (1968) and Kohlberg and Turiel (1971b.). In general, it may be said of these relations that attainment of a Piaget cognitive stage is a necessary but not sufficient condition for attainment of the parallel ego stage. All children at a given ego stage must have attained the parallel cognitive stage, but not all children at the cognitive stage will have organized their self-concept and social experience at the corresponding ego stage.

In summarizing relationships, we are aware that different theoretical frameworks for defining ego development have been proposed by many: Fromm (1947), Erikson (1950), Sullivan (1953), Sullivan, Grant and Grant (1957), Peck and Havighurst (1960), Harvey, Hunt and Schroeder (1961), Van den Daele (1968), Loevinger (1970), and Perry (1970). Regardless of differences in conception of ego stages, however, there is a good correlation between measures of ego maturity based on the different schemes (i=60-70: Van den Daele 1968, Sullivan and McCullough 1970). As Loevinger (1970) has pointed out, all measures of ego development will correlate, regardless of theory. (And all measures of ego development correlate with all measures of intelligence regardless of theory.) This is because all ego development schemes are based upon certain large regularities in the age-development of the self and of social attitudes, regardless of the theoretically proposed causes of those developments.

The schemes of ego-development we have discussed have been oriented primarily to developmental quality of thoughts and feelings about the self and the social world. Under the name of ego development also go more trait-like measures of ego-strength. One grouping of measures goes under the name of cognitive-style, including measures of analytic thinking, field independence, reflectivity, (as opposed to impulsivity) and attentional quality. Another grouping derives from the notion of prudence (or "the Protestant ethic"), e.g. delay of gratification, time perspective, and achievement motivation. While these measures may be loosely said to derive from a "bag of virtues" approach to ego-development, all have genuine non-arbitrary developmental components, unlike the Head Start bag of virtues. All increase regularly with age in various cultural settings; all correlate with intelligence but can be distinguished from it; all are "lower" in the disadvantaged than the advantaged; all show considerable predictability or stability over time, at least in the elementary and adolescent years (Kohlberg, LaCrosse and Ricks 1970); and all seem more modifiable in preschool and elementary years than psychometric intelligence.

These traits of "ego strength" add a quantiative dimension to the qualitative steps of ego development defined by stage-theory. The extent to which they will prove to tap something similar to measures of horizontal decalage of ego and cognitive stages remains to be determined. Findings in adolescence indicate that an individual's consistent application of the highest attained stage of moral development to verbal and behavioral situations of moral conflict is related to attention and field independence (Kohlberg and Turiel 1971b.). In other words, it is possible to define ego development as the highest stage attained and ego strength as the ability to function at one's highest stage in the face of cognitive or emotional ambiguity, novelty, etc.

Let us summarize what has been said in the last section. We discussed first the way in which the concept of intelligence could be analyzed within the developmental strategy for defining educational aims and standards. We pointed out that in spite of the flood of work on Piagetian concepts, more work, primarily longitudinal, needs to be done before the developmental concept of intelligence can be established as a useful aim and standard of preschool education. We further pointed out the relationship between a developmental conception of cognitive development and the general component of personality development called "ego development." We noted that a large body of work on elementary school children, adolescents and adults has given the concept of ego development firm and important meaning, although the amount of objective research on preschool ego development is still extremely small.

The results of a recent pilot study by Van den Daele (1969) suggest the potential value of modern ego development concepts for preschool educational research. In earlier work, Van den Daele (1968) had elaborated a stage measure of ego development which correlated appropriately with age, I.Q., social class and moral judgment development. In a subsequent study, we found that disadvantaged preschoolers, but more especially disadvantaged preschool boys, were at a

lower stage in their ego-scheme than were middle class children. As a pilot compensatory program, Van den Daele (1969) introduced adult male role models who controlled attractive adult-occupation play materials into a Head Start preschool program. The models role-played organized occupation-relevant roles with the children and asked the children to imitate them. The rationale for this intervention was based on a definition of the next ego stage to which the disadvantaged preschooler would move as one in which choices or ego-values were defined by attractive role models (as opposed to their current stage of ego-values defined by impulse and egocentric hedonism). Van den Daele found that his program did raise the disadvantaged children one stage to the mean of the middle class same-age population. It also yielded the usual 10 to 20 point I.Q. gain.

Obviously this study is only preliminary, and we are uncertain whether the stage change was a structural one or a change in the content of response and whether the treated children will move on to the next ego stage faster than untreated controls. Regardless of the eventual outcome of the study, however, it shows that imaginative preschool intervention can be carried out from the framework proposed in this paper.

The example returns us to the starting place of our paper. In proposing that the concept of ego development should be our overall guide in preschool research, we return to the fact that in some sense the concept of ego development has guided "child-developmental oriented" preschools for almost fifty years. In the practice of preschool education and research, however, the concept of ego development was largely equated with the mental health bag of virtues, in the fashion criticized in the beginning of our paper. Our initial criticisms now can be understood in a more positive light. We believe that viable preschools will probably remain child-centered places in which children primarily play, construct, explore, express and socially communicate and relate, though also engage in "cognitive" and language games, demonstrations and puzzles. Our proposal of a longitudinal-developmental logic and research basis for defining the goals and standards of such schools, however, seems a basic step if they are to do a better job.

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